HOW TO CONTROL THE IMPORTED FIRE ANT

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The imported fire ant[1] is a serious pest of animals, crops and rangeland in Southeast Texas. This insect, unlike many other insect pests, affects both urban and rural residents. Invasion by the imported fire ant into lawns, pasturelands, hay meadows, parks, school yards and recreational areas causes unsightly damage, is annoying and poses a possible health hazard. This vicious, aggressive pest closely resembles two native, but less serious, species of fire ants[2] commonly found in Texas.

Spread

The imported fire ant first entered the United States nearly 50 years ago from South America through the port at Mobile, Alabama. Since then it has become an infamous pest of both rural and urban areas in the South. It has spread over Alabama, Mississippi and Louisiana into Arkansas, Florida, Georgia, South Carolina, North Carolina, Tennessee and Texas.

Imported fire ant infestations were found in 55 Texas counties early in 1972. Infestations generally were confined to the area east of a line running from DeWitt County in South Central Texas northeast to Smith County in East Texas. Outlying infestations have been noted in the Dallas-Fort Worth, Waco and San Antonio metropolitan areas.

The native species closely resemble the imported fire ant, but their mounds are small compared to those built by the imported species.

Distinguishing between imported and native species is difficult. Positive identification should be made by specialists familiar with all three species. In most cases, identification is made by examining the larger workers. Each colony consists of a small number of the larger forms (major workers). Samples sent in for identification should contain three or more of the major workers. Contact your county agricultural agent for information on submitting specimens for indentification.

The imported fire ant spreads naturally through nuptial flights; however, the queens also may spread by crawling, drifting downstream in logs, traveling aboard cars, trucks or trains. Shipments of nursery stock or soil from an infested area may relocate an entire colony or nest.

The nuptial or queen flights commonly occur in April, May and June. These flights generally follow a rain. Unusual nuptial flights have been observed in late summer, fall and winter in the warmer areas along the Gulf Coast.

Damage

Imported fire ants can damage many kinds of young plants by gnawing

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1 Solenopsis invicta Buren

2 Solenopsis xylone McCook (southern fire ant); Solenopsis geminata Forel (Tropical fire ant)

holes in roots, tubers, stalks and buds. They may attack young, unprotected animals, such as newborn calves and pigs and newly hatched quail and poultry.

The most significant agricultural losses resulting from this pest are reduced efficiency of labor and machinery -- losses hard to assess in dollars. Their mounds damage machinery, prevent mowing operations and reduce the value of the land in heavily infested areas. Since these ants prefer land exposed to the sun, some of the most valuable farming and pastureland is heavily infested.

Imported fire ants interfere with harvesting of crops because their fiery sting is painful. Farmers lose valuable time during seeding, fertilizing and harvesting operations.

The imported fire ant is quite annoying to urban residents. They invade such areas as lawns, parks, playgrounds, school yards, cemeteries, golf courses and even homes. The ants will bite and sting anything that disturbs their mound. One ant can sting repeatedly. Afterwards, burning and itching occur, followed by the formation of white sore or pustule which may leave a permanent scar.

The venom of the imported fire ant is unlike that of other stinging insects. Persons unusually sensitive to this venom may suffer chest pains or nausea and even lapse into a coma from one sting.

Persons who suffer severely from fire ant stings should receive immediate treatment for allergic reactions.

Development

The ant colony consists of three adult forms:

1. Winged fertile females (queens) which lay the eggs. At one stage in the life history of an ant colony there is typically only one ant -- the young, mated female.

2. Winged fertile males which mate with the queens.

3. Worker ants which are wingless and usually sterile. Adult workers of the imported fire ant differ in size. The larger forms are referred to as "major workers"; the smaller as "minor workers". Activities of the two appear the same.

The fertile winged forms live in seclusion until it is time for them to leave the colony (mound) and begin their only mating flight. The fertile males are smaller and blacker than the queens. They fly directly from the mound surface while the queens usually climb on nearby plants and slowly lift their bodies into the air.

Once airborne, the ants fly out of sight and mate in flight. The males die soon after mating while the fertilized queens find suitable nesting sites, shed their wings and begin digging underground chambers in which they lay eggs.

The queen first lays a cluster of 10 to 15 eggs and looks after her first egg cluster almost constantly. When the eggs hatch (8 to 12

days), the helpless larvae depend on the queen for food from her body. Later the queen lays clusters of 75 to 125 eggs, and the larvae receive food gathered by the workers. The larvae pupate in 6 to 12 days and adults emerge in 9 to 16 days. A longer time is required for development of the winged forms. Mound building by newly established colonies is not conspicuous for 12 to 18 months after the young queen initiates egg laying.

The average-sized colony may contain 100,000 to 500,000 workers and only a few dozen winged forms.

The workers are red or black and are 1/8 to 1/4 inch long. They forage for food, maintain and enlarge the mound, care for the brood and protect the colony.

Imported fire ants build mounds in almost any type of soil but are more prevalent in open areas such as cultivated fields, pastures, parks, lawns and meadows. They prefer areas fully exposed to sunlight. They often are found in rotting logs around stumps and occasionally under buildings.

The mounds constructed by the imported fire ant average 15 or more inches in diameter and 10 to 12 inches in height. Around stumps, shrubs or posts, the mounds may attain a height of 3 feet.

Solution to the Problem

The following goals have been established:

1. Survey to determine the extent of imported fire ant infested area.

2. Set up quarantine regulations to prevent the ants from invading additional states and regions.

3. Treat outlying infestations first to shrink the infested area.

4. Suppress ant populations within a generally infested area so that uninfested land is protected.

Three coordinated steps to control the imported fire ant now being taken are: (1) surveys, (2) quarantines and (3) treatment.

Surveys

Surveys are conducted by Federal and State pest control workers to determine the outer limits of the generally infested areas and the extent and degree of infestation. Such information is vital to program officials, advisory committees and other federal-state agencies in planning effective program procedures to combat the pest.

Surveys are continuous because of the ever-changing pattern of infestation. Efforts to spot new infestations are intensified in the fall and winter months when mounds are less obscured by vegetation.

Quarantines

A Federal quarantine was invoked in 1958 to help prevent the interstate spread of the imported fire ant and to protect treated areas from reinfestation. The federal quarantine and parallel state quarantines regulate the movement of materials such as soil, gravel and sand or products with soil attached and unmanufactured forest products.

By inspecting these products, and treating them if necessary, state and federal program personnel have kept them moving within trade channels in compliance with federal and state quarantine regulations. Thus, long-distance spread of the pest through commerce has been prevented.

States immediately affected by quarantines are: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, South Carolina and Texas.

Treatment

Properly used insecticides are the only practical means of ridding an area of imported fire ants. Insecticides can be applied by aircraft, motorized ground machinery and hand applicators. Each area must be studied to determine the best method and timing for the application.

Aircraft are used to treat large, generally infested, open areas and sites not easily reached by other means. Ground equipment, motorized and hand, is used to treat small blocks in easily accessible places or to retreat occasional mounds that reappear. Various combinations of aircraft and other methods sometimes are used.

Isolated infestations beyond the boundary of the generally infested areas are treated first to shrink the outer edge of the infestations.

Control

Changes have been made for more effective methods of combatting this pest. Heptachlor was first used when the program began. The biggest breakthrough in the program came in 1961 with the development of an effective formulation called Mirex bait. Mirex bait contains a specific combination of soybean oil, ground corncob grits and Mirex - an insecticide.

Mirex Bait

Mirex is commercially available in a bait containing 0.15 percent Mirex (Mirex 150 or 2X). It is applied broadcast at the rate of 5 pounds of bait per acre. This formulation and rate deposits 3.4 grams, or less than 1/7 ounce, of the toxicant uniformly distributed on each acre.

A second broadcast application generally is required after at least 4 to 6 months elapse. Additional applications may be required to clean up remaining mounds. However, individual mound treatment is the more

practical approach in this clean-up operation. Individual mound treatment may be called for initially in areas where infestations are light and physical distribution of the bait is practical.

In treating individual mounds, use 1/2 ounce or 1.5 level tablespoons per mound. The mound must not be disturbed at time of treatment. Scatter the bait at or very near the mound so that the workers will carry it into the colony in their normal foraging behavior. Do not retreat until the initial application has had an opportunity to complete its kill. This requires about 3 months.

Mirex currently offers the safest means for controlling the imported fire ant. Mirex, (1) it gives effective control with relatively low rates of toxicant -- less than 1/7 ounce of technical insecticide per acre; (2) it can be applied under less critical weather conditions than contact insecticides because ants seek it for food; and (3) it is formulated as a bait to selectively control the imported fire ant reducing the possibility of possible harmful side effects on non-target organisms in the control areas.

Precautions must be taken, however, to prevent contamination of sensitive areas such as fish ponds, wildlife refuges and estuarine areas in large block or area treatments with Mirex.

Another desirable feature is its delayed toxic action on the ants. This delay allows the foraging ants time to carry the bait into their colony and distribute it to the queen and brood before it starts taking effect. Several weeks may be necessary before the colony is completely killed out.

It should be noted that single treatments with Mirex bait will not eradicate fire ants if applied during or shortly after mating flights. Newly mated queens do not forage, and, since Mirex bait leaves no residue, it will not kill young queens in the process of forming new colonies. With precise application timing it is possible to eliminate the ants with a single treatment. It will not prevent reinfestation from surrounding areas where populations are not treated.

Heptachlor, Chlordane and Dieldrin

Heptachlor, chlordane and dieldrin are effective, economical materials which can be used to control the imported fire ant. These insecticides may be used in nurseries, industrial sites, lawns, golf courses, cemeteries, parks and other places where long-lasting effectiveness is necessary. Since these materials are classified as chlorinated hydrocarbon insecticides, they should be used where they will not be a hazard to wildlife or result in excessive residues in raw agricultural commodities.

Chlordane and heptachlor may be used as a broadcast soil treatment in areas where imported or other species of fire ants forage. Where these materials can be used, the granular form is most frequently applied. However, either liquid or other dry formulations also may be used. The broadcast rate for chlordane is 1.0 to 1.5 lbs. actual per acre, while heptachlor may be used at the rate of 1.25 lbs. per acre.

In small, lightly infested areas, the ants may be controlled by treating the individual mounds with heptachlor, chlordane or dieldrin. Individual mound treatment usually kills the ants in the particular mound, but it does not prevent infestation in untreated areas. Treated areas should be examined within 3 weeks after treatment, and surviving colonies should be retreated. When possible, insecticides should be applied during the winter or the cool months of spring.

The mound treatment is simple. First, tear down the mound and apply 1 to 2 cups of a granular form or dust containing 10 per cent chlordane or 5 per cent dieldrin or 10 per cent heptachlor either by hand or dust gun to the mound and to the ground within a 10 to 12-foot area on all sides. The following spray mixtures also may be used to treat mounds:

Emulsifiable concentrate	Tablespoonfuls to 3 gallons water
Chlordane (4 lb. per gal.)	4
Dieldrin (1 1/2 lb. per gal.)	12
Heptachlor (2 lb. per gal.)	8

Thoroughly saturate the mounds.

Heptachlor, chlordane and dieldrin are not currently registered for large block or area treatment of the imported fire ant. Check with your county agent concerning the safety and advisability of treating specific areas.

Caution

Heptachlor, chlordane and dieldrin should not be applied where food, feed or forage will be grown. Dairy animals and animals being finished for slaughter must not be permitted to graze in treated areas. The insecticides must be kept out of water used by humans or animals. The insecticides should not be applied to food crops. Directions on the manufacturer's label should be carefully checked and followed.

A community or county interested in an area-wide control program should contact the county agent for help in planning and coordinating the program with Plant and Animal Health Service personnel. For additional information, contact your county agricultural agent or write the Extension entomologist, Texas A&M University, College Station, Texas 77843.

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